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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 09/536,618 | 03/28/2000 | Toyokazu Fujii | 43889-929 | 5999 |
| 20277 | 7590 | 04/13/2005 | EXAMINER | |
| MCDERMOTT WILL & EMERY LLP 600 13TH STREET, N.W. WASHINGTON, DC 20005-3096 | | | PHAM, HOAI V | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2814 | |

DATE MAILED: 04/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/536,618

Applicant(s)

FUJII ET AL.

Examiner

Hoai v. Pham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 39-69 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 39-69 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/018,181.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 39-54 and 56-69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art (fig. 18, pages 3-5) in view of Fazan et al. [U.S. Pat. 5,597,756] previously applied.

With respect to claims 39-43, 47-51, 54 and 56, Applicant Admitted Prior Art (fig. 18, pages 3-5) discloses a semiconductor device comprising:

a substrate (1) having a semiconductor region (fig. 18);

an insulating film (57) formed on said semiconductor region and having a property of reflowing due to a heat treatment under predetermined conditions, and the insulating film (16) comprising borophosphosilicate glass (see col. 4, lines 9-11);

a silicon nitride film (58) formed on said insulating film (57) (fig. 18);

a contact hole formed through said silicon nitride film (58) and said insulating film (57) (fig. 18); and

a contact electrode (59) formed in said contact hole.

Applicant Admitted Prior Art fails to disclose a silicon oxide film formed between and in contact with the upper surface of said insulating film (borophosphosilicate glass) (57) and lower surface of the silicon nitride film (58). However, Fazan et al. discloses that a silicon oxide film (21) formed between and in contact with the upper surface of said insulating film (borophosphosilicate glass) (16) and the lower surface of the silicon nitride film (22) (see col. 3, lines 60-64). Therefore, it would have been obvious to the skilled in the art to modify the device of Applicant Admitted Prior Art by having the silicon oxide film formed between and in contact with the insulating film (borophosphosilicate glass) and the lower surface of the silicon nitride film as taught by Fazan et al. in order to reduce stress between the insulating film (borophosphosilicate glass) and the silicon nitride film (see col. 4, lines 6-9).

With respect to claims 44-46 and 53, Applicant Admitted Prior Art discloses that the insulating film (57) is planarized (see fig. 18).

With respect to claim 52, Applicant Admitted Prior Art discloses that the contact electrode (59) is in contact with the insulating film (57) (see fig. 18).

With respect to claims 57-62, Fazan et al. discloses that the silicon oxide film (21) has a thickness such that a stress against a deformation of said silicon nitride film (22) caused by a heat treatment is applied to said silicon nitride film (see col. 4, lines 5-11).

With respect to claims 63-69, Fazan et al. discloses that contact hole (32) is formed through said silicon oxide film (21), and a part of said contact electrode (51) is in contact with said silicon oxide film (21) (see fig. 7).

4. Claim 55 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art (fig. 18, pages 3-5) in view of Fazan et al. [U.S. Pat. 5,597,756] previously applied as applied to claim 51 above, and further in view of Douglas [U.S. Pat. 4,807,016] previously applied.

Applicant Admitted Prior Art and Fazan et al. do not explicitly disclose that the insulating film includes phosphorus at concentration of not less than 3.0 wt%. However, Douglas discloses that it is known in the art for the insulating film (BPSG) including phosphorus at concentration of 1-10 wt% (see col. 1, lines 39-43). Moreover, the concentration range would have been obvious to an ordinary artisan practicing the invention because, absent evidence of disclosure of criticality for the range giving

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unexpected results, it is not inventive to discover optimal or workable ranges by routine experimentation. *In re Aller*, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955).

Furthermore, the specification contains no disclosure of either the critical nature of the claimed dimensions of any unexpected results arising therefrom. Where patentability is aid to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. See *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990). Therefore, it would have been obvious to the skilled in the art to select the phosphorus of Applicant Admitted Prior Art with the concentration of not less than 3.0 wt% to form the insulating film (BPSG).

Response to Arguments

5. Applicant's arguments with respect to claims 39-69 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoai v. Pham whose telephone number is 571-272-1715. The examiner can normally be reached on M-F.

7. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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8. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



HOAI PHAM
PRIMARY EXAMINER